

cells are not granular. This does not mean necessarily that chloroform acts differently, but probably only more drastically than coal tar, paraffin and mazola oil, or mixtures of them.

This is a preliminary report.

¹ Jorstad, L. H., and Johnston, C. G., *PROC. SOC. EXP. BIOL. AND MED.*, 1926, **xxiv**, 86-88.

² Burrows, M. T., *Am. J. Anat.*, 1926, **xxxvii**, 2, 289-349.

³ Opie, E. L., and Alford, L. B., *J. Am. Med. Assn.*, 1914, **lxii**, 895.

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Contractures Caused by Tenotomy and by Tetanus Toxin.

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The term, contracture, is here used to designate a state of permanent shortening of a muscle which persists after section of the motor nerve or after death of the animal. Since under these conditions no nerve impulses can reach the muscle it is obvious that when once developed this sort of shortening is independent of the nervous system and is due to a more or less permanent alteration of the muscle. These contractures develop too quickly to be due to fibrosis and histological sections show no increase in connective tissue. The muscle fibers themselves have acquired a new and shorter length.

When a resting muscle is made to support a moderate load it undergoes in addition to the elastic stretch, which disappears promptly when the load is removed, also a more or less permanent elongation (Nachdehnung of Blix,¹ permanent deformation of Langelaan²). In the contractures caused by tendon section and by tetanus toxin the elasticity remains approximately normal but the resistance to permanent elongation is greatly increased.

In addition to its action on the spinal cord, tetanus toxin also exerts a direct action on muscle, causing a shortening and increased resistance to permanent elongation when injected after section of the motor nerve.

This is a preliminary report.

¹ Blix, M., *Sk. and Arch. f. Physiol.*, 1892-95, **iii**, 295; **iv**, 399; **v**, 150.

² Langelaan, J. W., *Brain*, 1915, **xxxviii**, 235.